

Abdullah T. Nasr PhD

THE UNIVERSITY OF JORDAN

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PROFILE HIGHLIGHTS

- 9+ years of teaching Chemical Engineering courses at the University level
- 15+ years of international experience in research and development of classical chemical processes such as heat transfer in two phase flow, crystallization, colloids and interfacial science, and free radical polymerization
- Experienced in acquiring ABET accreditation for Chemical Engineering Department
- 3+ years of experience in creating statistical models, using Design of Experiments (DOE), which relate critical parameters to response variables
- 2+ years hands-on experience in chemical process design and development, which includes developing process flow diagrams (PFDs), equipment design, and project capital cost estimation
- Developed an innovative design of sub-sea heat exchangers for offshore gas cooling (Shell, Netherlands). Created a MATLAB model for a series of MSMR crystallizers and run simulations to optimize and control operating conditions

EDUCATION

- Doctor of Philosophy in Chemical Engineering,** **2014**
Queen's University, Kingston, Canada
Thesis title: *Modeling and Development of Three-Dimensional Gel Dosimeters*
Graduate Courses: *Mathematical Modeling, Statistical Analysis and Experimental Design*
- Master of Chemical Engineering,** **2010**
Illinois Institute of Technology (IIT), Chicago, USA
Courses: *Advanced Reaction Engineering, Thermodynamics, Process Control, Numerical Methods, Colloids and Surface Science, Applied Mathematics, Transport Phenomena*
- Master of Technological Design/Professional Doctor of Engineering (PD.Eng),** **2003**
Department of Process Design and Development, University of Twente, Enschede, The Netherlands
Thesis title: *Design of Sub-Sea Heat Exchanger for Offshore Gas Cooling*
Courses: *Conceptual Design, Advanced Plant Design, Polymerization Technology, Industrial Catalysis, Techno-Economic Evaluation and Reactive Separation*
- Bachelor of Science in Chemical Engineering,** **2001**
Jordan University of Science & Technology, Irbid, Jordan

RESEARCH INTERESTS

- Three-Dimensional (3D) gel dosimeters
- Colloid and surface science
- Free Radical Polymerization
- Crystallization
- Process Modeling, Simulation, and Optimization
- Process Development and Design

COURSES TAUGHT

- Chemistry I
- Introduction to Chemical Engineering (Freshman level course)
- Principles of Chemical Engineering (Chemical Engineering Calculations)
- Engineering Thermodynamics
- Engineering Ethics
- Fluid Mechanics
- Chemical Engineering Reactions
- Unit Operation and Separation Processes
- Chemical Engineering Simulation lab (ASPEN Plus and ASPEN HYSIS)
- Supervised senior graduation project groups

TEACHING INTERESTS

- Thermodynamics
- Process Modelling and Simulation
- Reaction Engineering
- Transport Phenomena
- Equipment and Plant Design

PROFESSIONAL EXPERIENCE

- **Assistant Professor of Chemical Engineering** **2015-2024**
American University of the Middle East (AUM), Egaila, State of Kuwait.
 - Establishing new Department of Chemical Engineering by reviewing the study plan and creating courses' syllabi following the ABET standards in preparation for ABET accreditation.
 - Establishing educational laboratories for Chemical Engineering undergraduate students, which include Fluid mechanics lab, Heat and Mass transfer lab, Chemical Reaction Engineering lab, and Chemical Unit Operation lab.
 - Heavily involved and participated in acquiring ABET accreditation for the Chemical Engineering Department at AUM.

- **Research Assistant** **2010-2015**
Queen's University, Department of Chemical Engineering, Kingston, Canada
 - Developed radiation dose sensors for cancer radiotherapy, enhancing quality assurance
 - Improved manufacturing procedure for radiochromic 3D micelle gel dosimeters, reducing manufacturing time by 50%
 - Created statistical models using designed experiments, relating effects of key factors to the performance of 3D gel dosimeters
 - Modeled free-radical polymerization dosimeters, simulating difficult experimental conditions

- **Teaching Assistant** **2010-2013**
Queen's University, Department of Chemical Engineering, Kingston, Canada
 - Led two hour weekly in-class tutorials and held office hours for up to 132 students in Chemical Reaction Engineering course, assisting them to understand course materials.
 - Supervised 64 students in Unit Operations Laboratory, ensuring safe conduct of experiments
 - Evaluated course projects, laboratory reports and exams in Phase and Reaction Equilibrium, Unit Operation Laboratory, Numerical Methods, and Chemical Reaction Engineering

- **Research Associate** **2005-2009**
Illinois Institute of Technology (IIT), Department of Chemical and Biological Engineering, Chicago, USA
- Conducted molecular dynamic simulations, studying different crystallization processes
 - Designed, built and tested high-pressure hydrogen storage setup, studying hydrogen adsorption isotherms for carbon nano-tubes and metal hydrides
 - Developed a MATLAB model for a series of Mixed Suspension Mixed Product Removal (MSMPR) crystallizers, facilitating computer simulations to optimize operating conditions
 - Designed, built and tested jacketed crystallizer with ultrasound probe, studying effect of ultrasound waves on crystal nucleation
 - Designed, built, and tested air-bubbling column, studying effects of silicon oxide surfactants on foamability, structure, and performance of non-aqueous foams
- **Teaching Assistant** **2005**
Illinois Institute of Technology (IIT), Department of Chemical and Biological Engineering, Chicago, USA
- Taught *Unit Operation Laboratory*, which involved discussing experiments, supervising students and ensuring safe conduct of experiments, and evaluating laboratory reports
- **Process Engineer** **2004**
Jordanian Ministry of Water and Irrigation/Association of Jordanian Engineers, Irbid, Jordan
- Managed and supervised up to 26 operators for daily process activities, ensuring safe conduct
 - Performed laboratory testing on drinking water, controlling water quality
- **Project Engineer/Industrial Internship Fellow** **2002-2003**
Shell, Den Haag, the Netherlands.
- Designed two phase flow experimental setup, studying effect of air flow rate on two-phase flow heat transfer
 - Developed an innovative design for a sub-sea heat exchanger used in offshore gas cooling
- **Process Design and Development Engineer** **2001-2002**
University of Twente, Enschede, the Netherlands.
- Worked with different teams of engineers to conduct several technical projects including:
 - Conceptual Design of Fischer-Tropsch process in super critical medium
 - Technical design for a one step Methyl Iso-Butyl Ketone (MIBK) production plant using reactive separation unit
 - Techno-Economic Evaluation of MIBK Production Plant
- **Research Assistant** **2001**
Jordan University of Science and Technology, Department of Chemical Engineering, Irbid, Jordan
- Designed, built, and tested fluidized bed to study heavy metal removal from synthetic wastewater using hydrogen-based solid amberlite

PUBLICATIONS

A. Journal Publications

1. ZA El-Rub, D Halawa, I Alqudah, **AT Nasr**, M Naqvi, "Natural zeolite catalyst for tar removal in biomass gasification Systems: Kinetics and effectiveness evaluation" *Fuel* 346, 128393
- 2.
3. M. T. Munir, Ahmad Mohaddespour, **Nasr AT**, Susan Carter, "Municipal solid waste-to-energy processing for a circular economy in New Zealand" *Renewable and Sustainable Energy Reviews*. **145**, 111080, 2021.
4. **Nasr AT**, KM Alexander, LJ Schreiner, and KB McAuley, "Leuco crystal violet micelle gel dosimeters: I. Investigation of opportunities for improvements" *Phys. Med. Biol.* **60**, 4665-4683, 2015.
5. **Nasr AT**, KM Alexander, T Olding, LJ Schreiner, and KB McAuley, "Leuco crystal violet micelle gel dosimeters: II. Recipe Optimization" *Phys. Med. Biol.* **60**, 4685-4704, 2015
6. **Nasr AT**, T Olding, LJ Schreiner, and KB McAuley, "Evaluation of the potential for diacetylenes as reporter molecules in 3D micelle gel dosimetry," *Physics in Medicine and Biology* **58**, 785-805, 2013
7. **Nasr AT**, LJ Schreiner, and KB McAuley, "Mathematical modelling of the response of polymer gel dosimeters to HDR and LDR brachytherapy radiation," *Macromolecular Theory & Simulations* **21**, 36-51, 2012
8. Chain JMN, **AT Nasr**, LJ Schreiner, and KB McAuley, "Mathematical Modeling of Depth-Dose Response of Polymer Gel Dosimeters," *Macromolecular Theory & Simulations* **20**, 735-751, 2011
9. Mohameed HA, N Abdel-Jabbar, K Takrouri, and **AT Nasr**, "Model-Based Optimal Cooling Strategy for Batch Crystallization Processes," *Trans IChemE*, **81**, Part A, 578-584, 2003

B. Conference Proceedings

1. **Nasr AT**, KM Alexander, LJ Schreiner, and KB McAuley, "Opportunities for improving the performance of LCV micelle gel dosimeters: I. preliminary investigation" *Journal of Physics: Conf. Ser.* **573**, article 012037, 2015.
2. **Nasr AT**, KM Alexander, LJ Schreiner, and KB McAuley, "Opportunities for improving the performance of LCV micelle gel dosimeters: II. Recipe optimization" *Journal of Physics: Conf. Ser.* **573**, article 012038, 2015.
3. Olding T, KM Alexander, C Jechel, **AT Nasr** and C Joshi, "Delivery Validation of VMAT Stereotactic Ablative Body Radiotherapy at Commissioning" *Journal of Physics: Conf. Ser.* **573**, article 012019, 2015.
4. **Nasr AT**, T Olding, LJ Schreiner, and KB McAuley, "Preliminary evaluation of diacetylene-based 3D micelle gel dosimeters," *Journal of Physics: Conf. Ser.* **444**, article 012041, 2013
5. McAuley KB, and **AT Nasr**, "Fundamentals of Gel Dosimeters," *Journal of Physics: Conf. Ser.* **444**, article 012001, 2013
6. **Nasr AT**, JNM Chain, LJ Schreiner, and KB McAuley, "Mathematical modelling of response of polymer gel dosimeters to brachytherapy radiation," *Journal of Physics: Conf. Ser.* **250**, article 012066, 2010

C. Non-Refereed Contributions

1. **A. Nasr** and S. Timer “Technical design for a one step MIBK Production Plant using Reactive Separation Unit”, Process Development School library – University of Twente, 2003. Supervisors: Prof.dr.ir. H. van den Berg and Dr.ir. L. van der Ham.
2. G. Steenkamp, **A. Nasr** and S. Timmer "Techno-Economic Evaluation of MIBK Production Plant”, Process Development School library – University of Twente, 2003. Supervisor: Prof.dr.ir. C.J. Asselbergs.
3. **A. Nasr** , S. Timmer and G. Steenkamp "Separation of Acetone-MIBK-Water Azeotropic system", Process Development School library – University of Twente, 2002. Supervisor: Prof.dr. Ross Taylor
4. M. Habash and **A. Nasr**: "Numerical Solution for Cooling of a sphere in contact with well-stirred fluid", Process Development School library – University of Twente, 2002 .Supervisor: Prof.dr.ir. Hans Kuipers.
5. **A. Nasr** and M. Habash "Polymers Properties Online Measurements", Process development school library – University of Twente, 2002. Supervisor: Prof.dr.-ing. habil. G. Weickert.
6. **A. Nasr** and M Alhalabi "Selective Oxidation of n-Butane to Maleic Anhydride via the riser approach over the VPO catalyst system", Process development school library – University of Twente, 2002. Supervisor: Prof.dr. J. Moulijn.
7. A. Borker, M, Nasser, **A. Nasr** and M. Habash “Conceptual Design of Fischer-Tropsch process in super critical medium”, Process Development School library – University of Twente, 2002. Supervisor: Dr.ir. A.B. Heesink.

CONFERENCE PRESENTATIONS

- **Nasr AT (Speaker)**, JNM Chain, LJ Schreiner, and KB McAuley, “Modelling of free-radical polymerization and diffusion of acrylamide and bisacrylamide in polymer gel dosimeters used in radiation dose detection for brachytherapy cancer treatment,” 61st Canadian Chemical Engineering Conference, London, Canada, October, 2011
- **Nasr AT (Speaker)**, T Olding, LJ Schreiner, and KB McAuley, “Preliminary evaluation of diacetylene-based 3D micelle gel dosimeters,” 7-th International Conference on 3D Radiation Dosimetry, Sydney, Australia, November, 2012
- KM Alexander (Speaker), **AT Nasr**, T Olding, KB McAuley, and LJ Schreiner, “Characterization of a new gel dosimeter for radiation therapy using optical CT imaging” 12-th Imaging Network Ontario Symposium, Toronto, Ontario, Canada, March, 2014

AWARDS

- Ontario Graduate Scholarship (OGS) for academic years 2011/2012 and 2012/2013
- Sutherland Scholarship for the academic year 2010/2011
- Queen’s Graduate Award 2010-2014
- Graduate Student Admission Scholarship at Illinois Institute of Technology 2004-2005
- TwAIO Scholarship, University of Twente – The Netherlands, 2001-2003
- Jordan University of Science and Technology Award, 2000

PROFESSIONAL DEVELOPMENT WORKSHOPS

- Networking Skills. (2014, Kingston, Canada)
- Time Management. (2014, Kingston, Canada)

- Presentation Skills. (2013, Kingston, Canada)
- Foundations of Project Management I. (2013, Kingston, Canada)
- Communication Skills. (2013, Kingston, Canada)
- Skills of Business Etiquette. (2013, Kingston, Canada)
- Project Management. (2003, Enschede, Netherlands)
- Oral Presentation Techniques. (2003, Enschede, Netherlands)

WORKPLACE SAFETY TRAINING

- Safety in the laboratory (2010, Kingston, Canada)
- Workplace Hazardous Materials Information System (WHMIS) (2010, Kingston, Canada)
- First Aid Training (2011, Kingston, Canada)

PROFESSIONAL AFFILIATIONS

- Canadian Society for Chemical Engineering (CSCHE)
- American Institute of Chemical Engineers (AIChE)
- Jordan Engineers Association

COMPUTER SKILLS

- ASPEN PLUS, ASPEN HYSIS
- MATLAB
- FORTRAN
- GROMACS for Molecular Dynamics Simulation
- Microsoft Office (Word, Excel, PowerPoint and Visio)